

Overview of Cloud Computing

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Quick reference guide – concise, organized, and easy to read

1. What Is Cloud Computing?

A model for delivering on-demand computing resources (servers, storage,

Definition databases, networking, software, analytics, AI, etc.) over the Internet, paid for as you use them.

Key Idea Move hardware & software from local premises to remote, scalable data centers managed by a **cloud provider**.

Benefits

- Cost efficiency • Scalability • Faster time-to-market • Global accessibility • Automatic updates & security patches

2. Service Models (What You Consume)

Model	What It Provides	Typical Use Cases	Example Services
IaaS (Infrastructure as a Service)	Virtualized compute, storage, networking. You manage OS, middleware, apps.	Running custom VMs, big data processing, disaster recovery sites.	Amazon EC2, Google Compute Engine, Microsoft Azure VMs
PaaS (Platform as a Service)	Runtime environment, development tools, database services. You focus on code.	Rapid app development, API management, CI/CD pipelines.	Google App Engine, Azure App Service, Heroku
SaaS (Software as a Service)	Fully functional applications delivered via the web.	Email, CRM, collaboration, ERP, analytics.	Office 365, Salesforce, Google Workspace
FaaS (Function as a Service) – <i>serverless</i>	Executes single functions in response to events; no server management.	Event-driven workloads, microservices, data pipelines.	AWS Lambda, Azure Functions, Google Cloud Functions

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3. Deployment Models (Where It Lives)

Model	Description	Control / Responsibility	Typical Scenarios
Public Cloud	Resources owned & operated by a third-party provider; shared across many customers.	Provider handles hardware, network, physical security.	Start-ups, variable workloads, global reach.
Private Cloud	Dedicated infrastructure for a single organization (on-premises or hosted).	Organization retains most control; provider may manage hardware.	Regulated industries, legacy migration, strict compliance.
Hybrid Cloud	Combination of public & private clouds with orchestration between them.	Shared responsibility; workload placement is dynamic.	Burst-to-cloud during peaks, data sovereignty, phased migration.
Multi-Cloud	Use of services from two or more public cloud providers simultaneously.	Organization coordinates across vendors.	Avoid vendor lock-in, leverage best-of-breed services, geographic redundancy.

4. Core Building Blocks

Component	Function	Popular Offerings
Compute	Run applications, process data.	Virtual machines, containers, serverless functions.
Storage	Persist files, objects, block data.	Object storage (S3, Blob), file storage (EFS, Filestore), block disks.
Databases	Structured & unstructured data services.	Relational (RDS, Cloud SQL), NoSQL (DynamoDB, Cosmos DB), Data warehouses (Redshift, BigQuery).
Networking	Connect resources securely & efficiently.	Virtual private clouds (VPC), load balancers, CDN, VPN, Direct Connect.
Security & Identity	Protect assets & control access.	IAM, encryption key management, security